

## STATE WEATHER SERVICES.

A tabular summary of the more prominent climatological features of each State and Territory, as given in the reports for August by the directors of the respective State Weather Services, is presented in Table XII. This table gives for the whole area of any State the average departure from the normal values of the current monthly mean temperatures and total precipitation; the maximum and minimum tempera-

tures and precipitations occurring anywhere within each State; the greatest and least monthly ranges of temperature occurring anywhere within the State. This data is essentially a summary of Table II, and therefore presents a somewhat different study of meteorological conditions from that given in Table I, which is based on regular Weather Bureau stations arranged in so-called climatic districts.

## OBSERVATIONS ON THE GREAT LAKES.

## REPORTS FROM VESSELS.

The Lake Marine Section of the Forecast Division has received reports from the captains of 65 vessels navigating the Great Lakes. The following miscellaneous items are extracted from their reports:

Capt. H. Cronkhite, steamship *Japan*, 2d, off Huron Island, Lake Superior, light snow flurries lasting about twenty minutes.

Capt. F. C. Rogers, steamship *Jay C. Morse*, Lake Superior, 21st to 31st, very smoky.

Capt. R. Jollie, steamship *C. B. Lockwood*, 29th, Lake Superior, very bright aurora from 9 to 11.30 p. m.

Capt. Edward Mooney, steamship *Wa-Wa-Tam*, Lake Superior, beautiful display of northern lights.

Capt. J. E. Tax, steamship *Maryland*, 3d, Lake Superior, brilliant display of aurora from 10.30 to 11 p. m.

Capt. W. A. Russell, steamship *W. A. Proctor*, 4th, St. Lawrence River, between Clayton and Brockville, aurora from 9 a. m. until after midnight.

Capt. Geo. Holdridge, *Barge 132*, navigating between West Superior, Wis., and Ashtabula, Ohio, last ten days of month weather very smoky.

The steamship *Manola*, on lakes Erie, Huron, and Superior, reports "So much smoke from forest fires that it has been impossible to make proper observations."

Steamship *Cuba* reports smoke, 6th, on Lake Erie; 10th, on Lake Michigan; 17th, on Lake Huron.

## REPORTS FROM U. S. LIFE-SAVING STATIONS.

Through the co-operation of the General Superintendent of the Life-Saving Service and the Secretary of the Treasury, the Weather Bureau has received monthly reports for the month of June from the keepers of 33 U. S. Life-Saving Stations on the Great Lakes.

## SUNSHINE AND CLOUDINESS.

## GENERAL REMARKS.

The quantity of sunshine, and therefore of heat, received by the atmosphere is a fundamental factor in meteorology; the quantity received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends largely upon the absorption by the atmosphere and varies with the distribution of cloudiness. The sunshine is now recorded automatically at about 38 regular stations of the Weather Bureau, either by its photographic or its thermal effects. The cloudiness is recorded by personal observations at all stations and is given in the column of "average cloudiness" in Table I.

## SUNSHINE.

An instrumental record of sunshine has been kept during the month at 18 stations by means of the photographic sunshine recorder and at 20 stations by means of the thermometric sunshine recorder; the results of these observations are given in Table IV, for each hour of local mean time (not seventy-fifth meridian time). The stations recording the largest percentages of sunshine between the hours of 11 a. m. and 1 p. m. were: Buffalo, 96; Chicago, 96; Columbus, 96.5; De Moines, 95.5; New York, 94.5; Vicksburg, 92.5.

The stations having the least percentage between these hours were: Galveston, 55; Santa Fe, 63.5; Savannah, 66.

The general average percentage for the whole month is given in the next to the last column of Table IV. The highest percentages were: St. Louis, 83; Kansas City and Cincinnati, 82. The lowest percentages were: Wilmington, 43; Eastport, 48; Galveston, 51.

## CLEAR SKY.

The average cloudiness between sunrise and sunset, as based on numerous personal observations, is given for each Weather Bureau station in Table I; the complement of this average cloudiness gives the observer's estimated percentage of clear

sky, and these latter numbers are given in the last column of Table IV.

## COMPARISON OF SUNSHINE AND CLEAR SKY.

The sunshine registers give the duration of direct sunshine whence the percentage of possible sunshine is derived; the observer's personal estimates give the percentage of area of clear sky. It should not be assumed that these numbers should agree, and for comparative purposes they have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observer's personal estimates of percentages of area of clear sky; the average excess for this month is 6 per cent for photographic records and 13.5 per cent for thermometric records:

## Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Cincinnati, Ohio.....	82	67	15	St. Louis, Mo.....	83	70	13
Kansas City, Mo.....	82	75	7	Key West, Fla.....	79	47	32
Dodge City, Kans.....	77	67	10	Salt Lake City, Utah....	78	63	15
Helena, Mont.....	74	67	7	Columbus, Ohio.....	77	55	22
Portland, Oreg.....	72	75	-3	Des Moines, Iowa.....	77	77	0
Denver, Colo.....	66	56	10	Chicago, Ill.....	73	54	19
Spokane, Wash.....	68	67	1	Baltimore, Md.....	72	63	9
Tucson, Ariz.....	67	46	21	Philadelphia, Pa.....	72	45	27
San Diego, Cal.....	65	68	-3	New Haven, Conn.....	71	66	5
Washington, D. C.....	65	55	10	Colorado Springs, Colo..	70	54	16
Cleveland, Ohio.....	63	54	9	Buffalo, N. Y.....	69	48	21
Bismarck, N. Dak.....	62	70	-8	New York, N. Y.....	69	51	18
Memphis, Tenn.....	57	54	3	Vicksburg, Miss.....	68	65	3
Santa Fe, N. Mex.....	56	42	14	New Orleans, La.....	66	65	1
San Francisco, Cal.....	54	56	-2	Boston, Mass.....	64	44	20
Savannah, Ga.....	54	52	2	Little Rock, Ark.....	63	40	23
Galveston, Tex.....	51	50	1	Portland, Me.....	61	35	26
Eastport, Me.....	48	39	9	Detroit, Mich.....	58	54	4
				Rochester, N. Y.....	55	51	4
				Wilmington, N. C.....	43	55	-12